Assorted Puzzler Problems
- Week 2

Name _____

Date ____ Block ____

Who is Faster?

Hector can run from the train station to his parents' house in eight minutes. His younger brother, Darius, can run the same distance eight times in one hour (not that he'd need to)! Who is faster?

Donut Try This at Home

Suppose a low-calorie donut has 95 percent fewer calories than a regular donut. How many low-calorie donuts would you need to eat to take in as many calories as you'd get from a regular donut?

The French Connection

Jason and Sandy took five tests during their first year in French class. Jason's scores were 72, 85, 76, 81, and 91. Sandy's scores were 94, 79, 84, 75, and 88. How much higher was Sandy's average score than Jason's average score?

Mathematics 1

1. Woolworth's had a going-out-of-business sale. The price of a telephone before the sale was \$39.98. What was the price of the telephone after a 30% discount? If the sale price of the same telephone had been \$23.99, what would the (percentage) discount have been?

2. Pick any number. Add 4 to it and then double your answer. Now subtract 6 from that result and divide your new answer by 2. Write down your answer. Repeat these steps with another number. Continue with a few more numbers, comparing your final answer with your original number. Is there a pattern to your answers?

3. Using the four integers 2, 3, 6 and 8 once each — in any order — and three arithmetic operations selected from among addition, subtraction, multiplication, and division, write expressions whose values are the target numbers given below. You will probably need to use parentheses. For example, to hit the target 90, you could write $90 = (3+6)\cdot(8+2)$.
(a) 3 **(b)** 24 **(c)** 36 **(d)** 30

4. When describing the growth of a population, the passage of time is sometimes described in generations, a generation being about 30 years. One generation ago, you had two ancestors (your parents). Two generations ago, you had four ancestors (your grandparents). Ninety years ago, you had eight ancestors (your great-grandparents). How many ancestors did you have 300 years ago? 900 years ago? Do your answers make sense?

5. On a recent episode of *Who Wants to Be a Billionaire*, a contestant was asked to arrange the following five numbers in increasing order. You try it, too.
(a) 2/3 **(b)** 0.6666 **(c)** 3/5 **(d)** 0.666 **(e)** 0.67

6. The area of a circle whose radius is r is given by the expression πr^2. Find the area of each of the following circles to the nearest tenth of a square unit of measure:
(a) a circle whose radius is 15 cm **(b)** a circle whose radius is 0.3 miles

7. Choose any number. Double it. Subtract six and add the original number. Now divide by three. Repeat this process with other numbers, until a pattern develops. By using a variable such as x in place of your number, show that the pattern does not depend on which number you choose initially.

8. Explain why there are two ways to compute each of the following:
(a) $3(2+3+5)$ **(b)** $\frac{1}{3}(9+6-3)$ **(c)** $(9+6-3)\div 3$

9. Given the information $w = 4$ inches and $h = 7$ inches, find two ways to evaluate $2w+2h$. What is the geometric significance of this calculation?

10. Simplify $x+2+x+2+x+2+x+2+x+2+x+2+x+2+x+2+x+2$.

A Golden Crown ?

The King asks Archimedes if his crown is made from pure gold.

He knows that the crown is either pure gold or it may have some silver in it.

Archimedes figures out that the volume of the crown is 125 cm^3 and that its mass is 1.8 kilograms.

He also knows that 1 kilogram of gold has a volume of about 50 cm^3 and 1 kilogram of silver has a volume of about 100 cm^3.

1. Is the crown pure gold? Explain how you know.

2. If the crown is not pure gold, then how much silver is in it?
   Show all your work.

Money

Mrs. Gonzales went to a store where she spent half of her money and then $10 more. She went to a second store, spent half of her remaining money and then $10 more. But then she had no money left. How much money did she have to begin with?

Playground

A fifth grade teacher noticed that there were fewer than 100 students on the playground. When she counted the students by 2's, there was one student left over. In fact, when she counted them by 3's, 4's, 5's or 6's, there was always one student left over. How many students were there on the playground that day?